1 There are similarities and differences between the structure of a typical plant cell and a typical animal cell.

(a) The nucleus of plant cells and animal cells contains chromosomes. In interphase of the cell cycle, individual chromosomes are present but cannot be seen. The chromosome material is known as chromatin.

(i) Changes occur in interphase, which result in a difference between the chromatin in the G1 phase compared with the chromatin in the G2 phase.

State **and** explain the difference in chromatin in the G1 phase compared with chromatin in the G2 phase.

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(ii) Describe the features of a nucleus, **other than** containing chromatin.

You may use the space below the lines for a diagram.

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(b) Starch, cellulose and pectins are polysaccharides found in plant cells but **not** in animal cells.

Pectins are complex polysaccharides that are found in the cell wall.

(i) Describe the structural features of starch that are **different** from the structural features of cellulose.

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(ii) Cell wall pectins can vary in different plant cell types and in different stages of cell development. Pectin molecules are released from cells as basic structures and then modified within the cell wall by adding side chains.

RG-I is a pectin molecule with a variable structure. The basic structure is a repeated disaccharide made from two different monosaccharides. RG-I has three different side chains that can be added in different positions.

Monoclonal antibodies (mAbs) are used to investigate the structure, location and role of cell wall pectins.

Suggest **and** explain why scientists need to use a number of different monoclonal antibodies when investigating a pectin such as RG-I.

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